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ABSTRACT

This paper, based on lectures given during a tour of Czechoslovakia, outlines how the county of Hertfordshire, England has endeavoured to meet its obligations to education, industry, commerce and professional personnel in the dissemination of scientific and technical information. During the first ten years of development, the program has ensured the full integration of the library into the educational program for each college served; and that the students have been trained to understand their use and the exploitation of sources of information. Librarians were appointed to each college with special responsibility to develop these concepts. Other areas considered in this comprehensive view of the Hertis Information Service include: personnel, personnel training, user needs, user training, bibliographical problems, liaison, and resources.

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The
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of

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by

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This paper is based on lectures given during a tour of Czechoslovakia to study Scientific and Technical services in May 1968. The tour was arranged under the British Council Cultural Exchange Programme.

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THE DEVELOPMENT OF HERTIS

In January 1968 the Parliamentary and Scientific Committee, an unofficial group of Members of both Houses of the U.K. Parliament and representatives of certain scientific and technical institutions, issued a report on the collection, dissemination, storage and retrieval of scientific and technological information. They stated six axioms for the nation's basic requirements for scientific and technological information storage and retrieval.

1. An adequate network of stocks of scientific and technical information, whether held in libraries or elsewhere.
2. Enough trained personnel to man and exploit them.
3. The development of the most modern methods of operation within them, and of access to them.
4. Comprehensive and modern systems of guides to their coverage and contents.
5. Managements willing and able to tap their resources and to think constructively about their use.
6. A clear definition of governmental or other responsibility for ensuring that these objectives are reached.

I hope to outline to you how the County of Hertfordshire has endeavoured during the past ten years to meet its obligations to education, industry, commerce and professional personnel in the dissemination of scientific and technological information, and how far we have managed to live up to these axioms on a local scale.

Hertfordshire is a County of some 404,520 acres, bordering on and to the North of London, and until 1939 it was mainly rural with paper making, printing, malting, brewing and gravel mining as its staple industries. The importance of agriculture and market gardening was reflected in the number of private and government sponsored research associations for agriculture and horticulture which existed in its boundaries. However, by 1944 the character of the county had changed appreciably as planners foresaw the need to provide for a period of post war expansion and, in particular, to relieve the congestion in the London area.

Apart from the development of a large residential area in the South immediately adjoining London, four new towns were planned and have now been built at Hatfield, Hemel Hempstead, Stevenage and Welwyn Garden City. During this time the population expanded by over a quarter of a million (it is now close on a million) - whilst industrial expansion followed with building and civil engineering, light engineering, including electronics, data processing and computers, manufacture and repair of vehicles and aircraft, and the manufacture of chemical and pharmaceutical products.

Such expansion, needless to say, placed a heavy stress on educational resources; to cater for education to advanced and postgraduate level, vocational training as well as the cultural and recreational activities of adults, the County Authority had to plan a vast development programme. From the humble prewar days of one Technical College, a School of Art and an Institute of Agriculture, handling some 8,000 students, there are now one major College of Technology (shortly to be designated a Polytechnic), offering degrees and diplomas in a variety of disciplines; two Colleges of Technology, primarily concerned with qualifying skilled technicians; nine Colleges of Further Education, primarily for technicians, vocational and cultural activities, a School of Art and an Institute of Agriculture providing altogether for some 60,000 student places.

By 1956, when the scheme was well underway, the problem of ensuring adequate library resources to benefit industry as well as education was given serious consideration. It was agreed that whilst each College should have its own library, co-ordination of library

stock and centralisation of information retrieval would be beneficial to all concerned. After my appointment as County Technical Librarian in 1956 to implement these ideas through the Hertfordshire Technical Information service (Hertis), a Committee was established by the Education Committee to advise on policy, selection of material and the general requirements for education and industry.

USER NEEDS AND TRAINING

In the development of any library service it is essential to be fully aware of user needs. It is, however, a fact that in studying user requirements care needs to be exercised, as the user is influenced in his ideas by his own experiences, which may in turn have developed from the more traditional methods generally adopted for communicating his informational needs. At that time it was clear that the majority of citizens were not conversant with the sources of information available to them, nor were they conversant with the best way of exploiting the resources. Under the circumstances the County decided to give priority to what was viewed as the long term project of developing axiom 5, the need to educate personnel so that when they eventually became managers they would be willing and able to tap information resources.

The significance of this decision has been reflected more recently in the Plan for the Development of the Hatfield College of Technology prepared by the College Academic Board. Part III of this Plan deals with the Library and Information Service and states:

'The most important guiding principle is that the library will be a major teaching instrument and play the central role in the Polytechnic's educational programme. This has four implications:-

- a. The function of the teacher must be re-appraised and artificial divisions between the library and other teaching locations broken down.
- b. The library must be stocked and equipped and furnished to function as a 'learning resource' centre so as to encourage and develop habits of independent study in all students.

- c. All students must learn how to use the library and to use it well.
- d. The professional library staff must be fully and effectively drawn into all Boards of Studies, Course Committees, etc.

'Another important guiding principle is that, whilst continuing to hold original materials and sources etc., a modern library and information service will aim at being positive and dynamic in contrast to the traditionally distributive and static service. The point here is two-fold:

- a. A positive information service will try to ensure that some at least of those who should benefit from new information hear of it.
- b. A dynamic library service will organise the classification, condensation and re-allocation of material and will aim to present it where necessary in forms different from those in which it is received.'

In the first ten years of development we can be reasonably satisfied with our programme of ensuring the full integration of the library into the educational programme for each College; and that students have been trained to understand their use and the exploitation of sources of information. Librarians were appointed to each College with special responsibility to develop such concepts. Later, as we became aware that such librarians (who are called Tutor Librarians) needed to be skilled teachers aware of the philosophy and principles of education, we instigated a special training course, in conjunction with a Technical Teacher Training College (Garnett College). We now recruit annually two qualified librarians and send them to the College for one year so that they may qualify as teachers. Within the Hertis organisation we hold at least one meeting each Academic Session to discuss course syllabi, new approaches to the problem and any other relevant educational matters.

Details of the work of these Tutor Librarians and the type of courses we provide at all levels of education have been described

in a number of articles by the staff. A book entitled 'The Library in Colleges of Commerce and Technology', edited by myself, was published in 1966 by Andre Deutsch, giving very full observations on the problems involved.

What is clear is that:

- a. Specialists in all disciplines must be taught to recognise the value of a modern library and information service and the best ways of using one; and accordingly efforts must always be made to provide all students, as part of the regular curriculum, with formal training in retrieval of the relevant specialist literature and use of the other documentation services as well as to make them familiar with modern tools and techniques of information handling and processing.
- b. Specialists in all disciplines must be taught the techniques of technical communication ("much more aggressively than they have in the past") so as to be able to express themselves clearly and succinctly and with proper regard for the subsequent retrieval of what they write. (The quotation is from the Weinberg Report).

The second priority in the foundation of the Service was to ensure that those who could benefit from new information should hear about it. In order to achieve this objective the problem resolved into two parts, one bibliographic and one communication or liaison. In the progress of the past two years it is clear that neither can be adequately resolved without studying fully the particular information requirements of different specialisms and classes of users; without the aid of technological developments; and without the aid of specialist staff drawn from a variety of disciplines. All of these factors have been underlined as major axioms by the Parliamentary Committee.

Bibliographical problems

At the commencement of the service we had to plan for the development of library resources in several colleges distantly sited

from one another. Whilst some would be similar or complementary, many had specialisms of their own, such as printing and gravure at Watford, building at St. Albans, agriculture at Oaklands, computer science at Hatfield. Under these circumstances a central clearing-house for stock was not practical - each College needed to obtain its resources though each needed to know what was held in other Colleges. It was therefore decided that cataloguing and abstracting should be de-centralised but production of the entries required for each College should be centralised.

It was also realised that academic staff and industrial personnel would need to be kept up to date with all references to their own particular discipline. The system adopted had to be simple to administer and economically viable.

The system which was subsequently evolved has been described in detail in a paper published at the First International Kongress fur Reprographie, entitled "Reprography aids 'Hertis' in its bibliographic service to education and industry". The procedure simply outlined is as follows:

1. A cataloguer at each college prepares a catalogue entry for every item of stock, including periodical articles. The name of the college is stamped on the slip which is then passed to Hatfield.
2. At Hatfield it is checked for conformity to the indexing system and then all the detail is embossed on a metal plate.
3. At the end of each week the trays of plates for each college, arranged in classified sequence, are printed - sets being sent to each college.
4. In the meanwhile every individual wishing to receive reference slips according to his discipline is named by the classification number on a separate, coloured metal plate. These plates are inserted in the trays at the appropriate subject location and the trays are then passed through the printing machine. Cards are then printed which are sorted and despatched according to

the individual requirements.

5. The trays of plates are then placed on one side and interfiled for a four week period. At the end of this time fresh cards are printed and mounted in page form. Offset plates are prepared and a Library Bulletin printed for all those wishing to have reference to the whole stock acquisition.
6. The plates are then interfiled in the main plate catalogue, from which special booklists can be prepared at any time.

This system is still in operation, though it suffers from certain disadvantages. The plate size is insufficient for our requirements, and the embossing time is still far too slow. Now that the College has its own computer we are exploring the potential of a computerised system. The concept is now well advanced and we hope that by the time we move into our new library in 1970 we shall have details of all our stock in a computerised form. The catalogues in the new library will be from computer print-out and our existing card catalogues, we anticipate, will become merely the librarians' tool relegated to the catalogue room.

At the same time, we believe that there is an extensive future for the individual's own desktop library - a possibility made practical through microforms. In order to test this theory, the National Reprographic Centre for documentation is preparing the first experimental system from which user reactions can be tested over the next eighteen months.

Liaison

However effective the bibliographic resources, and however effective may be the system for training the user, there is still room for interpreters of the store to meet particular problems posed by the user. Advances in science and technology often create problems which are inter or multi disciplinary in nature. Frequently the individual may not know what is his real problem. Yet, with help, it is remarkable how many problems can be solved through the skilled use of the printed word.

In launching a service based in the Colleges of Technology it was realised that the bibliographic service could be interpreted by the academic staff specialists and, whenever necessary, the laboratories and workshops could provide the opportunity not only for practical help but for research projects when required.

Nevertheless, it soon became obvious that the library needed its own liaison officers between the store and its users, from within the College and from industry. We therefore decided to appoint as Chief Information and Liaison Officer an engineer interested in handling problems and aware of the complex problems of communication. Later it became obvious that we needed specialists trained in a variety of information techniques to support his work. For this reason we established a trainee scheme whereby a graduate is recruited annually, spends one year in Hertis and one year on postgraduate training in the School of Librarianship at Sheffield University. This postgraduate school specialises in training scientists and engineers in technical librarianship.

A few figures and examples of the problems handled at the Headquarters of the service in Hatfield may not be without interest.

Table 1 - Firms in Hertfordshire by size - Employees

up to 10	11-50	51-100	101-100	201-200	501+	Total
220	470	161	114	87	60	1,112

Table II - Subscribers to Hertis - Industry

up to 10	11-50	51-100	101-200	201-500	501+	Total
1	14	15	13	26	38	107

Others

Res. Assoc.	Local Authority	Herts. Council Depts.	Others	Total
1	2	7	6	16

Table III - Major enquiries received at the Headquarters Library in Hatfield College of Technology, i.e. normally taking more than one-half man day.

The rise in enquiries over the past three years has made it necessary to control membership of Hertis. Whilst welcoming new members there is no active recruitment drive.

Period October 1966 - March 1967 April-September, 1967

Source of Enquiry				
Herts County Council	11	2.4%	3	0.7%
Hatfield Teaching Staff	63	13.7%	51	12.6%
Industrial	260	56.5%	284	70 %
Students at Hatfield	40	8.7%	11	2.7%
Other Colleges	32	6.95%	8	2.0%
Public Libraries	22	4.8%	24	5.9%
Other Sources	32	6.95%	25	6.1%
Total	460		406	

Table IV - Major enquiries for period April-September 1967
by size of firm

	Unknown	1-10	11-50	51-100	101-200	201-500	Over 500
Hertis	23		18	16	16	40	157
Non-subscribers	7	1	1	4	4	2	4

513 different sources were consulted to aid the successful solution to these major enquiries, of which 286 were solved through Hertis library resources, 60 through Hertis staff and College personnel, 66 through government establishments, 39 through industrial organisations and 62 through other agencies.

There is no detailed log of minor enquiries (i.e. enquiries taking less than one-half man day) but it is estimated that these average 600 per annum.

Neither major nor minor enquiries incorporate purely bibliographical requests, i.e. the loan of specific items from library stock.

Table V - Classification of major enquiries for period April-September 1967

Technical	223
Management	97
Others	86

The fact that so many major problems could be solved with informed use of library resources compares favourably with a study carried out by the Birmingham Chamber of Commerce. They asked 3,000 members of the Chamber of Commerce who had no library in their firm to submit their technical problems to a voluntary panel of librarians, information officers and engineers, who were able to

answer all these questions without difficulty.

Some examples of the kind of enquiries handled by Hertis:-

1. Present typical salaries in U.S. for electrical engineers.
2. Methods of clarifying hydrogen without the use of palladium.
3. Constructional details of a small solar cell.
4. Literature on Ferranti continuous path numerical control system.
5. Trace recent work at Pavlov Institute, Leningrad, on conditioning and lactation.
6. Load classification data on aircraft runway design.
7. Trace if the X-ray analysis for crystal structure for lead chromate (single crystals) has been done.
8. List of addresses of authorities for digital data transmission in public telephone networks for European countries as specified.
9. Technical details of torque limiters with and without electrical cut-outs.

Staff and staff training.

In an organisation such as Hertis where the staff may be scattered in a variety of colleges staff recruitment and co-ordination pose the delicate problem of securing a balance between the loyalty to the Institution in which they work and to the organisation (Hertis) whose success depends on the value and integrity of their contribution. This balance is only possible by careful consideration of the personalities involved and by endeavouring to maintain a high standard at the Centre so that each individual may have a sense of pride in corporate achievement. Additionally there is the need to provide opportunity for a member of staff to make and be known for his individual contribution. Fortunately an information service provides ample opportunity for initiative.

The staff in Hertis are therefore encouraged to contribute to a publication programme which embraces reading guides, bibliographies, news bulletins, and separates - or occasional papers on topics likely to be of interest to their colleagues. Specialisms are developed by providing opportunities for direct contribution to either education or information services as distinct from the bibliographic service. Additionally, as we must keep abreast of new techniques, staff showing interest or potential are given the chance to attend special courses or conferences which may help develop their talents.

A further factor of importance is to ensure that there is equal opportunity in each branch of the service. Too often the library service becomes subordinate to the information service, or vice versa - yet the same degree of knowledge and expertise is required to maintain both services. Hertis has not yet achieved parity between all the branches of the services but the main areas are now discernible and so too are many of the links which exist between them.

Briefly the principal areas of growth, recruitment and training may be defined as follows:-

Education; this is not solely the teaching in the use of libraries and information services but co-operating with other members of

the academic staff to encourage the use of the library as a teaching instrument. Finally there is the need to appraise and develop the library as a learning resource centre.

We therefore see the need for librarians with teaching ability, teachers with an intimate knowledge of books and, at the higher academic levels, information officers with teaching ability.

Information and Liaison; The readers' advisers in many libraries fulfil part of this function but, by adding a liaison function and recruiting staff with experience of the problems of production, the service is greatly enhanced. Although we have recruited our Chief Information Officer from Industry and have developed a training scheme for graduates, we are not satisfied with our progress. We need more liaison officers.

Information processing; The cataloguing function in most libraries is too narrowly defined. Whilst we obviously need to know the total resources of our library the user requirements for retrieval and arrangement may vary from discipline to discipline. In order to recognise this fact a variety of special retrieval systems may be required. Whilst librarianship deals extensively with this task, staff need to be constantly up-dated on the newer techniques. We may need not only librarians but data processing experts, systems analysts, computer personnel and other specialists. So far Hertis has recruited solely from the ranks of librarians though our training scheme for information officers embraces potential recruitment to this area.

Reading room administrators; This remains primarily the responsibility of the librarian, though subject knowledge is obviously beneficial.

Research; Staff must be encouraged to further their own knowledge as well as that of the organisation as a whole. In Hertis research has been primarily associated with reprographic techniques but we have a number of other staff projects likely to prove of value.

Research cannot be pursued adequately unless staff have time to do so and are backed with the tools and technicians they may require. The development of the National Reprographic Centre for documentation at Hatfield has shown how useful it is to have a team with common interest but different experience. Our team includes a reprographer, a design engineer, a photographic engineer and a librarian.

RESOURCES

It would be wrong in a paper attempting to give a comprehensive view of an information service to ignore mention of resources - obviously they should be accessible before any attempt is made to promulgate their use. However, it is possible to promote an information service with minimal resources of your own - providing you have access to sufficient material in your area - possible, but not practical nor economic. If an information service is successful it promotes use and it can be heavily strained. If there is no consideration given to the use of local resources, these resources may be strained to such an extent that their original users suffer. It is vital to control or plan for the growth of the service in such a way that this does not occur. If the user loses confidence in the service it is very difficult to win him back.

The extent of the resources must depend on the nature of the services to be provided. A commercially orientated service, particularly a product data service, requires completely different resources to that of a problem solving service for production and manufacture. The Hertis priorities in the provision of stock for industry and commerce were:-

1. An extensive range of abstract and bibliographic guides.
2. An extensive range of major handbooks, dictionaries and similar works.
3. An extensive range of serials with at least a ten year file of the major titles.

4. Sets of standards and specifications.
5. Technical and scientific literature.
6. Product data through commercial services.

Whatever the resources you possess it will not be enough. Information requirements are limitless for this is the extent of human knowledge. An individual information service must be able to call upon both national and international resources - and speedily. For this reason I appreciate the opportunity of meeting you all and seeing something of your resources. For if such contacts will facilitate the flow of information between Hertis and your organisation, between the United Kingdom and Czechoslovakia, and if the flow is in response to a problem which if solved could be to the common good of humanity - one can only feel both grateful and humble to have been one of the links in the chain.